From Dr. John Evans of Washington; Theodore N. Gill of Brooklyn, N. Y.; and Alpheus S. Packard, Jr., of Brunswick, Me.; accepting corresponding membership of the Society; — from the Royal Bavarian Academy, Munich, sending their publications; and from the Committee of the Humboldt Foundation, Berlin, asking the coöperation of the Society in the establishment of a fund for the promotion of scientific talent in works on Natural History and distant travels.

Mr. Nathaniel T. Allen of West Newton, Dr. Gustavus Hay of Boston, and Alpheus Hyatt, Jr., of Cambridge, were elected Resident Members.

February 15, 1860.

Dr. C. T. Jackson, Vice-President, in the Chair.

Prof. Agassiz made a verbal communication in opposition to the theory of Mr. Darwin, recently put forth in his work on the origin of species. Mr. Darwin he acknowledged to be one of the best naturalists of England, a laborious and successful writer; his works on the coral reefs, on the cirripeds, and his narrative of the voyage of the Beagle, show him to be a skilful and well prepared naturalist; but this great knowledge and experience had, in the present instance, been brought to the support, in his opinion, of an ingenious but fanciful theory. According to Darwin, the primary cell, by a process of differentiation and gradual improvement by natural selection, has produced all the diversities of animals, in geological and present times. He did not think it fair to compare the present fauna of the world with the fauna of any geological horizon as known in one locality; and he thought this method of comparison had led to this idea of gradual development. Animal representatives were as numerous and diversified in early geological periods as now; he instanced the brachiopods. In the lowest beds of the Potsdam sandstone we find *Lingula prima*, and allied species are found in the Silurian, De-

vonian, Carboniferous, Permian, and Triassic, and with occasional interruptions up to the living species; there is an unbroken succession of *lingulæ* up to the Jurassic strata; they are not found in the oölite, in the seven beds above the lias; in the lowest cretacean (neocomian) they appear again, then there is an interruption until the Tertiary epoch. About forty species of fossil *lingulæ* are found in these beds; only seven species of living *lingulæ* were known to exist until he had recently added an eighth (*L. Ravenelli*, Ag.) from South Carolina, the first found on the American side of the Atlantic basin; when the shell gapes, one valve moves over the other, a circumstance rare in the brachiopods. He thought the persistence of this form through so extensive a period, the last no more perfect than the first, was a fatal objection to the theory of gradual development.

Prof. Rogers admitted that the persistency of *lingula*, and other similar cases that might be adduced, were formidable objections to this theory; but he thought that Darwin would meet such objections by the fact that the vital characters of some animals fit them for resisting change and extinction better than more plastic natures; from our knowledge of domesticated animals we find that dogs have changed very much, and that cats have changed hardly at all; some have great energy of resistance, and some very little. He adduced several cases of interruption, like those in Bohemia illustrated by Barrande, and in middle Tennessee by Mr. Safford, which he explained by migrations to and from a given region. On the coast of Virginia and Maryland there is an extensive oyster-bed, but which has not been continuous through all time; at one time the oysters disappear, and clams make their appearance; the latter disappear, and oysters reappear; these he regarded as instances of emigration and remigrations over great spaces. Similar facts in Bohemia, embracing strata of many thousands of years' duration, show evidences of reintroduction of forms from below, colonization, and remigration. In middle Tennessee, we have the Black River limestone over the Potsdam sandstone; over this slaty limestones with Trenton fossils; after several hundred feet of thickness, this is succeeded by the Black River fossils again. He thought these evidences of migration, and not in the least degree of sudden creation without

previous parents; the *lingula* hiatus suggests a similar abandonment and return of allied species in remote geological epochs. In the case of *Calymene Blumenbachii*, which extends from the lower Silurian up to the Devonian, there is a great variety of forms acknowledged to be within the limits of one species, displaying a progressive variation amounting almost to specific difference. It may also be a question whether the geological horizon of animal origin has yet been reached in our investigations. He inquired of Prof. Agassiz if any vertebrate had ever been found in strata lower than the upper Silurian.

Prof. Agassiz remarked, as to these alleged migrations, that we know that species are well circumscribed within the limits of faunæ; and that before such a line of argument can be followed, it must be shown that any species pass from one continent to another, except from man's agency. In regard to the geological horizon of animal origin, he observed that the azoic system of rocks is not so metamorphosed as not to show traces of fossils if they had existed; fragments at least would be found; yet these rocks immediately underlie the Silurian strata rich in fossils. He thought that in this lowest system of fossils there was such a coordination of the animal series as shows that all its great and principal classes were then existing. Pander has maintained the existence of fishes below the point alluded to by Prof. Rogers, from what are considered their remains; he did not distrust these conclusions of Pander, though many do. Trilobites are found in the lowest beds; these are complicated animals, and belong among the highest crustaceans; in the three other great divisions of the animal kingdom it is not the lowest, but the highest representatives that are found; the earliest fishes are among the most perfect of their class, and have many reptilian characters; the mollusks belong to the high cephalopods, and the crinoids rank high among the echinoderms. In late general works, eleven or twelve subdivisions of the earth's crust are given; D'Orbigny makes twenty-seven, but he was prepared to show the occurrence of at least forty-eight successive periods of change, with characteristic fossils found neither below nor above their respective beds; the alleged identity of fossils in different strata was only apparent, and would be found so on actual comparison of specimens.

Mr. Emerson asked what had been the antecedents to the publication of the work on the "Origin of Species." He did not quite understand the attitude of the mind of the author; he thought that the mind of an investigator into the laws of nature ought to be judicial, prepared to weigh impartially the evidence afforded by all the facts, and to let the balance incline accordingly. But Darwin comes before the reader at once as an advocate of a seemingly foregone conclusion, and argues, not for the purpose of finding in what direction the evidence of any particular fact would lead the mind, but for the purpose of finding something in the fact favorable to his preconceived opinion. Admitting the difficulties in his theory, he tries to explain them away by various suppositions and *ifs*, which by frequent repetition and consideration seem in the mind of the author to become established truths, and are used as arguments.

Prof. Rogers stated in reply that the present work of Darwin is a *résumé* of his conviction on the subject, without the presentation of the facts upon which it rests, which he has not had time to arrange. The problem is admitted to be of transcendent difficulty, and such as no observer or theorist can hope now or perhaps ever positively to resolve. Mr. Darwin makes no pretensions to an absolute demonstration, but, after an impartial survey of the facts bearing on the subject and a candid appreciation of the opposing considerations, adopts the view set forth in his book, as offering, in his opinion, a more rational and satisfactory explanation of the history of living nature than the hypothesis of innumerable successive creations. Prof. Rogers regarded the work as marked in an extraordinary degree by fairness in the statement of opposing as well as favorable arguments, by the absence of dogmatism, and by all other evidences of a truth-loving spirit, as well as by the extent and variety of its knowledge and the breadth of its philosophical views.

As regards the statement that the most ancient types of life were higher or more perfect than recent ones, he had always considered Prof. Agassiz as maintaining that these earlier forms were of an embryonic character; and in this connection he remarked that the term "perfection" is just as indefinite as the word "species." He considered perfection as specialization in

each type; if an animal approach nearer perfection because, for instance, it be part fish and part reptile, or if a structure part animal and part vegetable be more perfect than the plant, then is the cell the type of perfection, combining as it does properties belonging to both kingdoms; he considered perfection, not the union of different types, but specialization in each particular type.

Prof. Agassiz considered perfection to mean an embodiment of the highest combinations, the most complex representation of life. The embryo fish presents features of its type superior to those of the adult fish; the tendency to specialization increases with its growth, and the animal at last becomes only a fish, losing its embryonic type of the higher vertebrates. As a generalization or philosophic conception, the vertebrate egg is superior to man himself, inasmuch as it embodies all that may be produced from it.

Mr. Scudder presented by title a description of *Hoplocampa rubi* by the late Dr. T. W. Harris, with remarks on its history by Noyes Darling, Esq., in letters to the same, as follows: —

Family Tenthredinidæ.

Genus *Selandria*, (Leach.)

Sub-genus *Hoplocampa*, (Hartig.)

Selandria (*H.*) *rubi* (Harris).* Black; a spot on each side of the collar, middle of the dorsum, and legs, dirty yellow; hindmost tarsi dusky; wings smoky. Length of the body nearly one fifth, expansion of wings one half of an inch.

Larva, green: 6 dorsal rows of tubercles bearing 2 black bristles, and 4 lateral rows on each side bearing white bristles; most of these tubercles have 2 bristles, some have 3, and the anterior ones of the first segment have 4 or 5 each, — the tubercles alternate in the rows. Each segment, therefore, has 14 setigerous tubercles; along the lower margin of the body are a few more single bristles, or short tubercles, irregularly placed. Bristles not barbed, $\frac{7}{20}$th of an inch in length.

* See Address upon Injurious Insects, by Noyes Darling, p. 13. New Haven, 1845. New England Farmer, i., p. 164, 1849; ii., p. 33, 1850.